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FINAL REPORT

Assessment of Geology, Energy, and Minerals (GEM) Resources

ROUGH HILLS GEM RESOURCE AREA

(NV-010-03)

ELKO COUNTY, NEVADA

Prepared for

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

March 1983

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Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada

Prepared For:

United States Department of the Interior
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Scientific Systems Development Branch

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BLM Contract No.: YA - 553 - CT2 - 1042

March, 1983

This report was prepared as part of a Phase I Assessment of GEM Resources within designated Wilderness Study Areas in Oregon, Idaho and Nevada.

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- Dr. Antonius Budding - Oil Shale and Tar Sands
- Mr. Raymond Corcoran - Field Verification
- Dr. James Firby - Paleontology
- Mr. Ralph Mason - Coal
- Mr. Richard Miller - Uranium and Thorium
- Mr. Vernon Newton - Oil and Gas
- Mr. Herbert Schlicker - Industrial Minerals and Geologic Hazards
- Dr. Walter Youngquist - Geothermal
- Dr. Paul Weis - Metals and Non - Metals.

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Ms. Pamela Ruhl provided clerical and editorial assistance throughout the project. Ms. Sara Mathews assisted with occurrence information and drafting. Mr. Philip R. Jones and Mr. Michael A. Becker produced all documents relating to the project using TERRADATA's word processing and document production systems.

EXECUTIVE SUMMARY

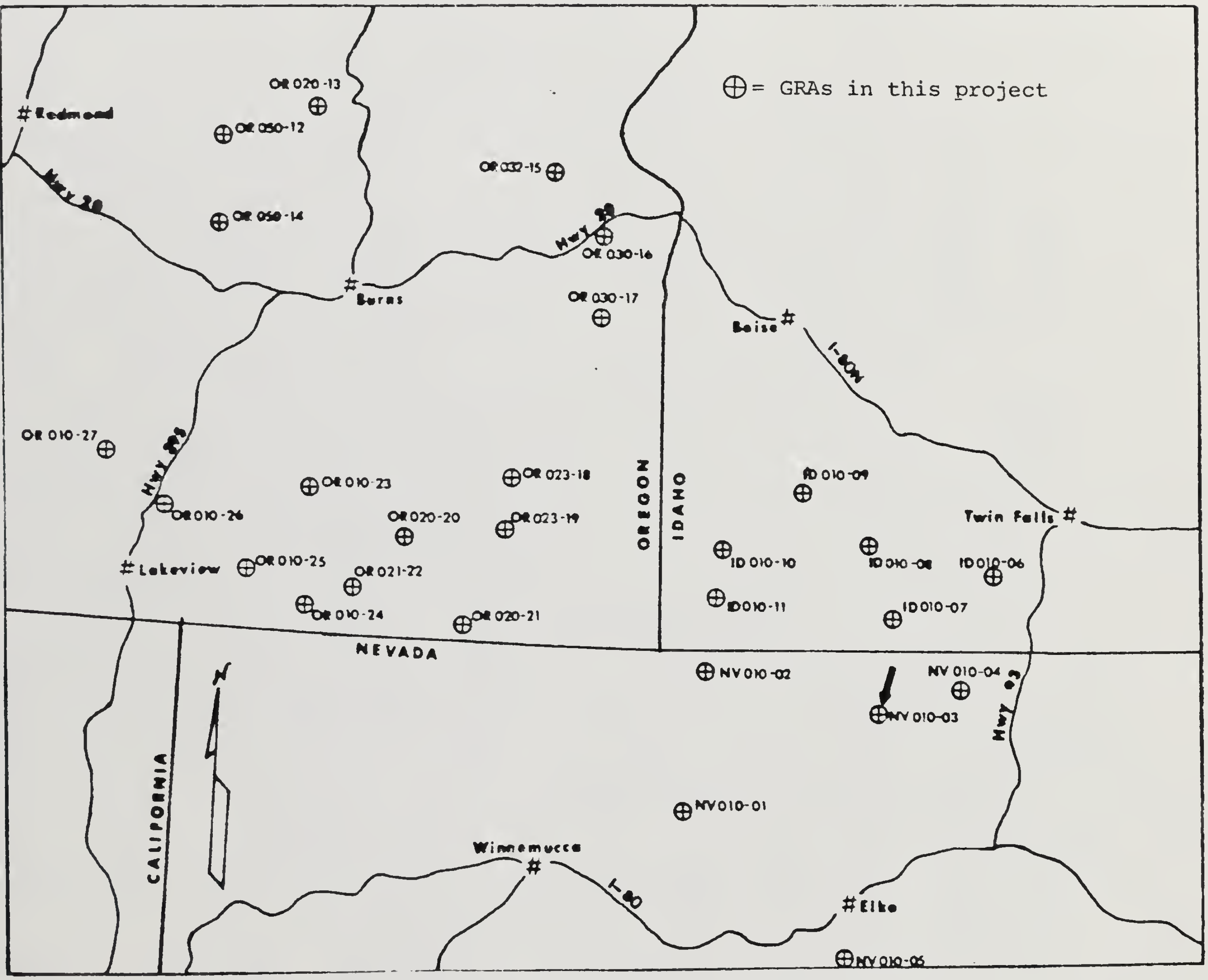
The purpose of this project is to evaluate and classify environments favorable for the occurrence of geology, energy, and minerals (GEM) resources in selected wilderness study areas (WSAs) in southeastern Oregon, southwestern Idaho, and northern Nevada. **(See TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")** GEM resource environments have been rated on a scale that ranges from one to four, with one being least favorable and four being most favorable. Favorability classes two and three represent low and moderate favorability, respectively. Confidence levels range from A to D with A being low confidence and D being high confidence. The confidence levels are directly related to the quantity and quality of the information available for the determination of the favorability classes.

The specific area with which this report deals is the Rough Hills resource area (GRA number NV-010-03) which is located in northeastern Nevada (see attached location map). The GRA contains about 144 square miles within Townships 43N through 44N and Ranges 56E through 57E. It contains one WSA; WSA 010-151, which has an area of 6,685 acres. The Rough Hills GRA is about 60 miles from Elko, Nevada.

The Rough Hills GRA is within the Basin and Range physiographic province. It contains rocks that range from Paleozoic miogeoclinal sediments to Tertiary volcanics and volcaniclastic sedimentary rocks and Quaternary sediments. The area is east of the major structural Antler orogenic belt. The Rough Hills GRA is adjacent to the Alder, Charleston, and Island Mountain Mining Districts. Basin and Range fault blocks are common in this portion of Nevada. The geologic environments and inferred geologic processes in the Rough Hills GRA indicate a high favorability (Class 4) for the occurrence of metals, limestone, phosphate, and silica resources; a moderate favorability (Class 3) for barite resources; and low to no favorability (Classes 2 or 1) for all other GEM resources (see Table, below). Favorability for limestone and phosphate is high in the Rough Hills GRA because Carboniferous limestones and the Permian Phosphoria Formation are known to be present.

Metals favorability (Class 4) is primarily based on the proximity of the WSA to several mining districts. This classification has a high confidence level (D) because known deposits occur nearby. Oil and gas favorability (Class 2) is based on the presence of favorable lithologies and information from nearby bore-holes.

GRA Location Map



Classification Of Lands Within The
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada
For GEM Resource Potential

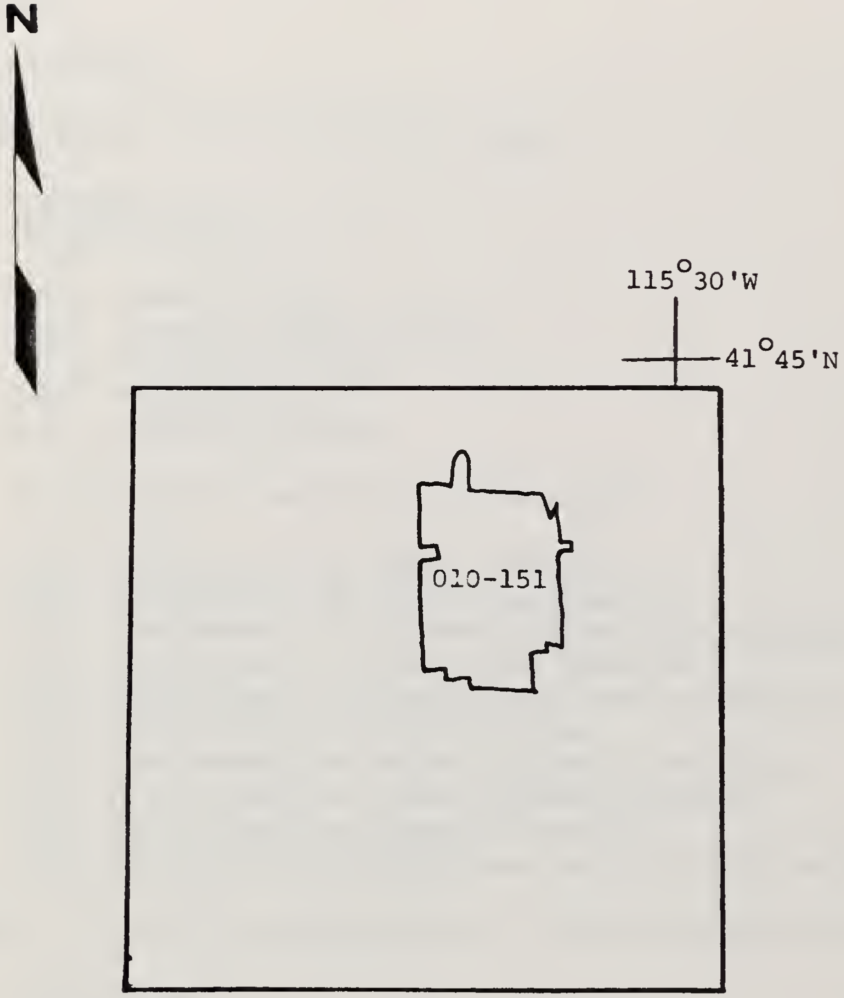
COMMODITY	AREA	CLASSIFICATION LEVEL	CONFIDENCE LEVEL	REMARKS
Metals	Entire GRA	4	D	Au, Ag, Pb, W, Mo, Sb, Cu.
Geothermal	Entire GRA	1	C	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	2	B	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	4	D	
Bentonite	Entire GRA	2	A	
Diatomite	Entire GRA	1	B	
Clinoptilolite	Entire GRA	1	B	
Barite	Entire GRA	3	A	
Silica	Entire GRA	4	C	
Phosphate	Entire GRA	4	D	
Paleontology	Entire GRA	2	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:
Class 1 - Least Favorable
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

TERRADATA recommends that geophysical surveys be performed to more precisely determine the thickness of Tertiary units in the WSA. Selective drilling is recommended to support or refute the classification of the area for metallic GEM resources prior to any final land-use decision. Further work is important in this study area because of the high probability of the occurrence of several strategic and critical metal deposits within WSA 010-151. (See Table 3-4 of TERRADATA's report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")

Land Classification Map
Rough Hills GRA
(NV - 010 - 03)
Elko County Nevada



Scale 1:250,000
(Wells 1°x2° NTMS Quadrangle)

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1. INTRODUCTION

This report is one of 27 GRA technical reports that summarize the results of a Phase I assessment of the geology, energy, and minerals (GEM) resources in selected portions of southeastern Oregon, southwestern Idaho, and northern Nevada. The study region was subdivided into 27 GEM resource areas (GRAs), principally for ease of data management and interpretation. The assessment of GEM resources for this project consisted of an interpretation of existing literature and information by experts knowledgeable in both the geographic area and specific commodities. A restricted field verification program also was conducted. It is possible that the assessment would be different if detailed field exploration, geochemical sampling, and exploratory drilling programs were undertaken. (See the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")

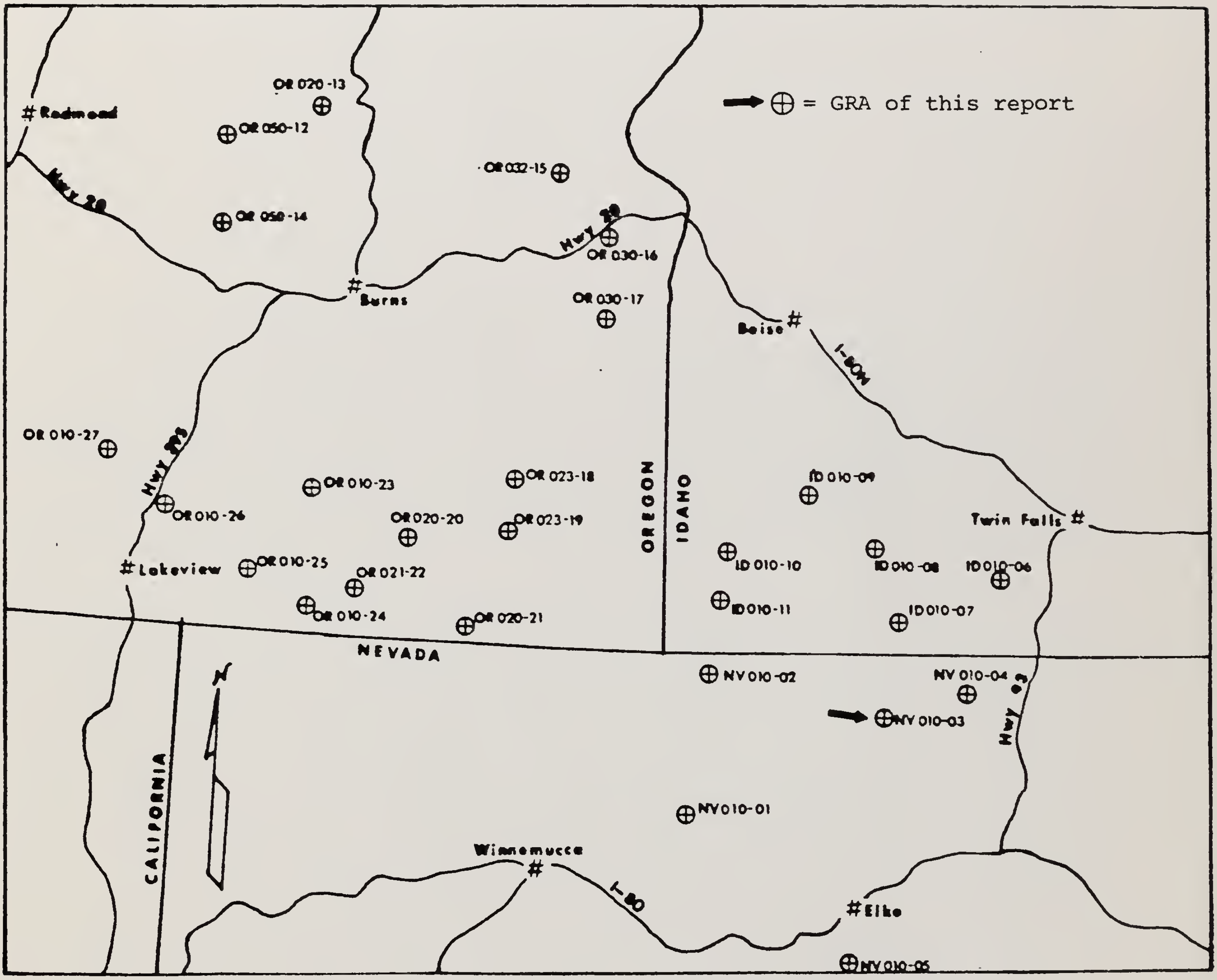
This report summarizes the assessment of the GEM resources potential of the Rough Hills GRA (NV-010-03). See Figure 1-1. Commodity categories for which this GRA was evaluated are:

- Metals
- Oil and Gas
- Oil Shale and Tar Sands
- Geothermal
- Uranium and Thorium
- Coal
- Industrial Minerals
- Paleontological Resources
- Geologic Hazards
- Educational and Scientific Localities (ESLs)

Geologic environments within the Rough Hills GRA have been rated with respect to their favorability for the occurrence of these different commodities. The favorability rating scale ranges from one to four, with one being least favorable and four being most favorable. Confidence levels in these ratings also have been assigned. These confidence levels range from A to D, with A being low confidence and D high confidence. Assigned confidence levels are related to the quantity and quality of the information available for the determination of the favorability ratings.

FIGURE 1-1

GRA Location Map



2. DESCRIPTION OF THE ROUGH HILLS GRA

2.1 LOCATION

The Rough Hills GRA (NV-010-03) is in northeast Nevada. It lies between latitudes 41°33'N and 41°45'N and longitudes 115°28'W and 115°44'W. The GRA contains approximately 144 square miles within Townships 43N through 44N and Ranges 56E through 57E (see Figures 1-1 and 2-1). The area contains one Wilderness Study Area; WSA 010-151 (6,685 acres). The Rough Hills GRA is in the Elko Resource Area of the Elko BLM District. The area is about 60 miles from Elko, Nevada, which is the nearest transportation center offering a minimum of rail, highway, and/or charter-air services. Access to the contained WSA is via county maintained dirt or packed-gravel roads. Vehicular access to the interior of the WSA is poor to non-existent.

2.2 GENERAL GEOLOGY

The Rough Hills GRA is in the Wells 1°x2° NTMS Quadrangle. The data available for this area includes NURE investigations(1,2,3)*, general mineral resource information(4), and limited large scale geologic mapping(5). Detailed geologic information is scarce in most areas outside of known mining districts(5). Occurrence information evaluated for this GRA includes MILS, CRIB, claims, and leases. The overall quantity and quality of information is fair for the commodities that occur in the associated known mining district. The available information is poor to fair for all other commodities; most do not occur in or near the area.

The Rough Hills GRA is within the Great Basin portion of the Basin and Range physiographic province. The Basin and Range Province consists of generally north-trending fault-block mountains separated by parallel intermontane basins. The mountain blocks are commonly ten to twelve miles wide and are separated by alluviated valleys of comparable width. In northern Nevada and southern Idaho this characteristic Basin and Range physiography is not as pronounced. The mountain ranges become sub-parallel and the basins are smaller and not as well defined. Local relief generally is less than 5,000 feet. The physiography of the Great Basin reflects the structural and lithologic complexity of the underlying bedrock. The Great Basin portion of the Basin and Range Province extends from southern Nevada, northward into southern Oregon and Idaho. The northern-most extremity is located just north of the town of Burns, Oregon. Rocks in the area range from Paleozoic miogeoclinal suites to Tertiary volcanogenic and lacustrine strata (see Figure 2-2).

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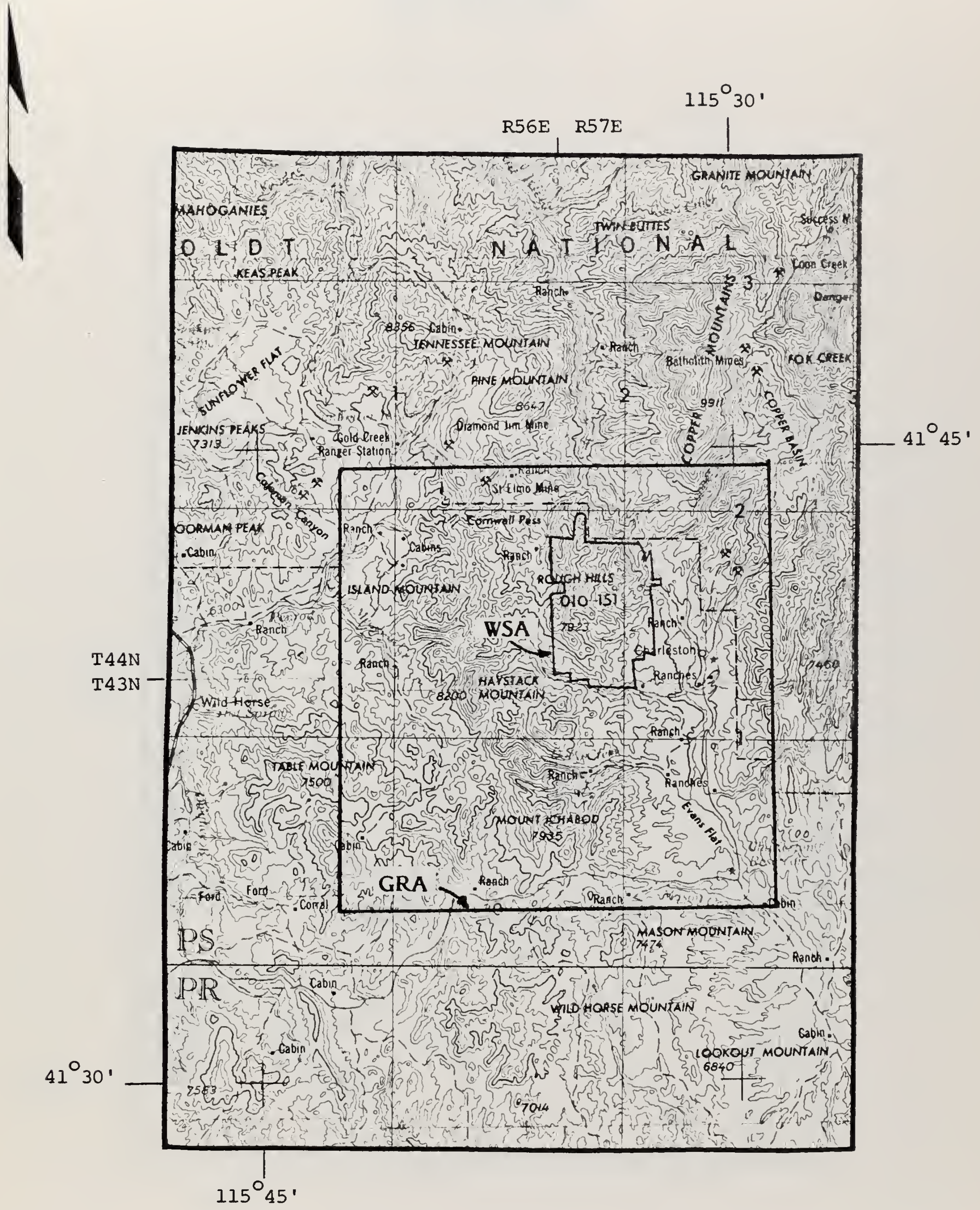
* In this report, citations are superscripted numbers. They refer to bibliographic entries listed in Appendix A: References Cited.

FIGURE 2-1

Topographic Map
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada



Scale 1:250,000
(Wells 1°x2° NTMS Quadrangle)

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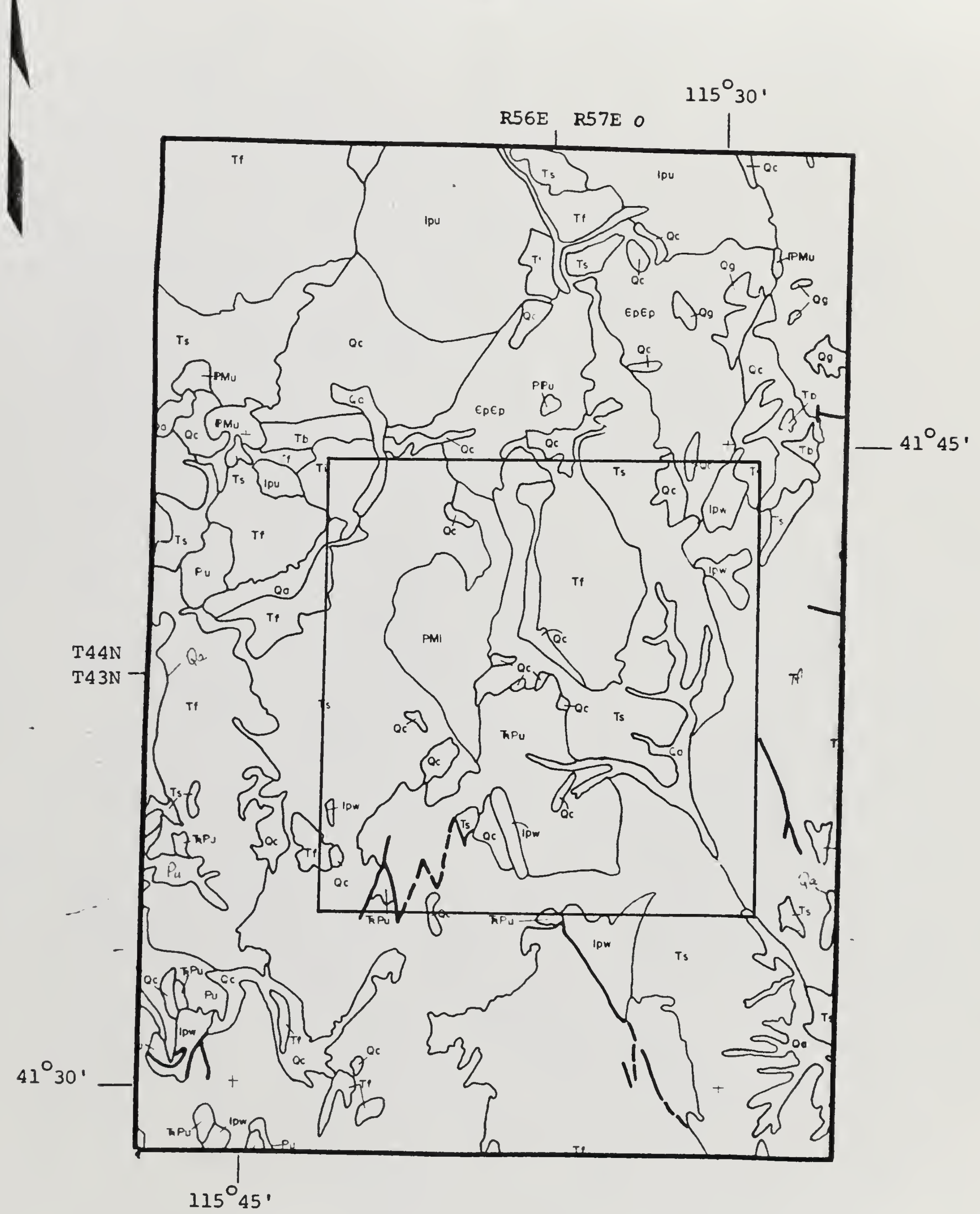
FIGURE 2-2

Geologic Map
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada



Scale 1:250,000
(Wells 1°x2° NTMS Quadrangle)

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FIGURE 2-2
(Continued)

Geologic Map Legend For
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada

Qc	- Colluvium and Landslide Deposits.
Qa	- Alluvium: Silt, sand and gravel along streams, including terrace deposits.
Qg	- Glacial Deposits: Mainly glacial moraines and rock glaciers.
Ts	- Tertiary Sedimentary Rocks: Dominantly tuff, ignimbrite, conglomerate, gravel, sandstone, siltstone, shale, and limestone.
Tf	- Felsic Volcanic Extrusives: Dominantly rhyolites to dacites; flow and domes.
Tb	- Mafic Volcanic Extrusives: Dominantly andesites to basalts.
Ti	- Igneous Intrusives: Mainly granite, rhyolite, and quartz monzonite.
TRPu	- Triassic-Permian Clastic Sedimentary Rocks, Undifferentiated: Minor greenstone and silty limestone. Includes Edna Mountain, Moenkopi and Thaynes Formations.
Pu	- Upper Permian Sedimentary Rocks, Undifferentiated: Dominently carbonate phosphatic rocks. Some chert and limestone. Includes the Phosphoria, Gerster, and Pequop formations, and Park City Group.
PML	- Permian-Mississippian Limestone: Includes Tripon Pass and VanDuzer Limestones, and Banner and Nelson Formations.
IPMu	- Pennsylvanian-Mississippian Clastic Sedimentary Rocks, Undifferentiated: Dominently conglomerate, sandstone, and shale. Includes Diamond Peak, Chainman, Schoonover, and Webb Formations.
Lpw	- Lower Plaeozoic Western Facies: Dominantly fine-grained clastic sediments with some limestones and dolomites.
Lpu	- Lower Paleozoic Carbonates Undifferentiated: Dolomite and limestone. Includes Simonson and Sevy, Lone Mountain, Laketown, and Ely Springs Dolomites, and Guilmette, Devil's Gate, Nevada, Roberts' Mountain, and Hanson Creek Formations.
ꞒpꞒp	- Prospect Mountain Quartzite: Quartzite with phyllite interbeds.
━	- Fault (dashed where inferred).
—	- Geologic contact (dashed where inferred).

2.2.1 Geomorphology

The Rough Hills GRA consists of several topographic elements. These are broad, alluviated valleys, rugged mountainous regions, and a wide undulatory plain with numerous rounded hills and buttes in the southwestern portion of the study area. The plain is primarily underlain by flat-lying Tertiary sedimentary units. It has a poorly established dendritic stream pattern and contains a few ephemeral lakes.

The central portion of the Rough Hills GRA is an area underlain by a series of north-trending rugged hills. The Haystack Mountain-Mount Ichabod system is a north-northwest trending highland area that is underlain by Permo-Carboniferous limestone units. Rough Hills compose an ellipsoidal area underlain by Tertiary rhyolites. The Bruneau River has been deeply incised through the northeast part of this rugged area. The area has little or no preferred geomorphic grain; it exhibits a radial drainage pattern.

Another physiographic element within the Rough Hills GRA is represented by the broad valleys of Penrod Creek in the northwestern part of the GRA, and the Bruneau River in the east and northeast portion of the GRA. These valleys consist of floodplains with meandering streams and tributaries. The Bruneau River is the major drainage within the GRA.

2.2.2 Lithology and Stratigraphy

The Rough Hills GRA is underlain by rock units that range from Late Paleozoic metamorphozed sandstones and shales to Quaternary alluvium and colluvium. Late Paleozoic western facies strata compose siltstones, shales, limestones, and dolomites. These are exposed in three inliers, two of which are along a west-facing scarp in the northeastern portion of the GRA. The third inlier of the Late Paleozoic strata is along the west side of Mount Ichabod in the north-central portion of the area.

Permo-Carboniferous limestones, which compose the Tripon Pass and VanDuzer Limestones, underlie the north-trending ridge of Haystack Mountain in the west-central portion of the GRA. These units formed in a marginal basin environment and contain minor amounts of fine-clastics that were derived from the Antler orogenic belt to the west.

Permian-Triassic strata overlie the Permo-Carboniferous carbonate sequence. These consist of clastic material derived from an eastern source interbedded with marine argillaceous limestones. These strata include the Edna Mountain, Moenkopi, and Thaynes Formations.

Although not exposed within the Rough Hills GRA, upper Permian sedimentary units are undoubtedly present beneath the Permo-Triassic and Tertiary volcanic and volcaniclastic strata. This interpretation is important in considering the favorability of the area for phosphate deposits in the Permian Phosphoria Formation.

Tertiary rocks in the Rough Hills GRA consist of rhyolitic to dacitic flows and domes, pyroclastics (tuffs, ignimbrites), volcanic siltstones and shales, and fresh-water limestones. Volcaniclastic and other Tertiary sedimentary rocks immediately underlie nealy all lowland regions of the GRA.

WSA 010-151 comprises most of the Rough Hills, and is underlain by a thick sequence of rhyolite to rhyodacite flows and domes. These rocks range from light gray aphanitic-rhyolite with subtle fluxion structures to coarsely porphyritic rhyolites and rhyodacites. Field reconnaissance indicates that porphyritic rhyolite and rhyolite-porphyries make up the bulk of the lithologies within the Rough Hills. The rocks have a dark reddish hue and consist of phenocrysts of quartz and potassium feldspar set in an aphanitic groundmass. One specimen, found near the northeastern margin of the WSA, had a glomeroporphyritic texture.

Quaternary alluvium underlies the stream valleys and scattered deposits of Quaternary colluvium occur throughout the area. Some of these later deposits may be the result of landslides.

2.2.3 Structural Geology

The tri-state area of northeastern Nevada, southern Oregon, and southwestern Idaho is characterized by several major structural elements. During the Early Paleozoic this area was the site of marine sedimentation in the north-northeast trending Cordilleran geosyncline. Sedimentation persisted in three sub-parallel belts until the end of the Devonian Period. One sedimentation belt was located in the eastern half of Nevada and received near-shore to littoral deposts of shallow-water carbonates with a minor amount of interbedded shale and sandstone. The second sedimentation belt was in the western half of the state and was the site of transitional, progressively deeper-water deposits. The third belt, located farther west, was the site of eugeoclinal deposits.

In Late Devonian time, the Antler Orogeny developed along a north-northeast trending swath through northwest Elko County, Nevada, and on into southwestern Idaho(6). The Rough Hills GRA is just east of the axis of the Antler orogenic belt. The orogeny culminated in a period of extensive thrust faulting that includes the Roberts' Mountain thrust.

The Sonoma Orogeny occurred during the Permian in north-central Nevada(6). This deformational episode included more thrust faulting west of the Rough Hills GRA.

Taphrogenic activity was the last major structural event in the region. This primarily occurred in the Middle to Late Tertiary. The thick rhyodacitic volcanic pile of Rough Hills is related to this episode.

The Rough Hills GRA has little notable structure except for volcanogenic features that are associated with the rhyolite extrusives. A few faults are mapped in the southeastern portion of the GRA. Total offset along these faults is not known.

2.2.4 Paleontology

Fossil assemblages present within the Rough Hills GRA vary from Paleozoic migeoclinal fauna to non-marine Tertiary fauna and flora. Mississippian to Permian strata contain the ubiquitous shelf to miogeoclinal brachiopod-coral dominated assemblage. Tertiary rocks in the Rough Hills GRA are esstentially non-fossilferous. Mollusks and fish may be found in tuffaceous lacustrine deposits. Mammalian and leaf fossils have been reported in correlative strata from outside the GRA.

2.2.5 Historical Geology

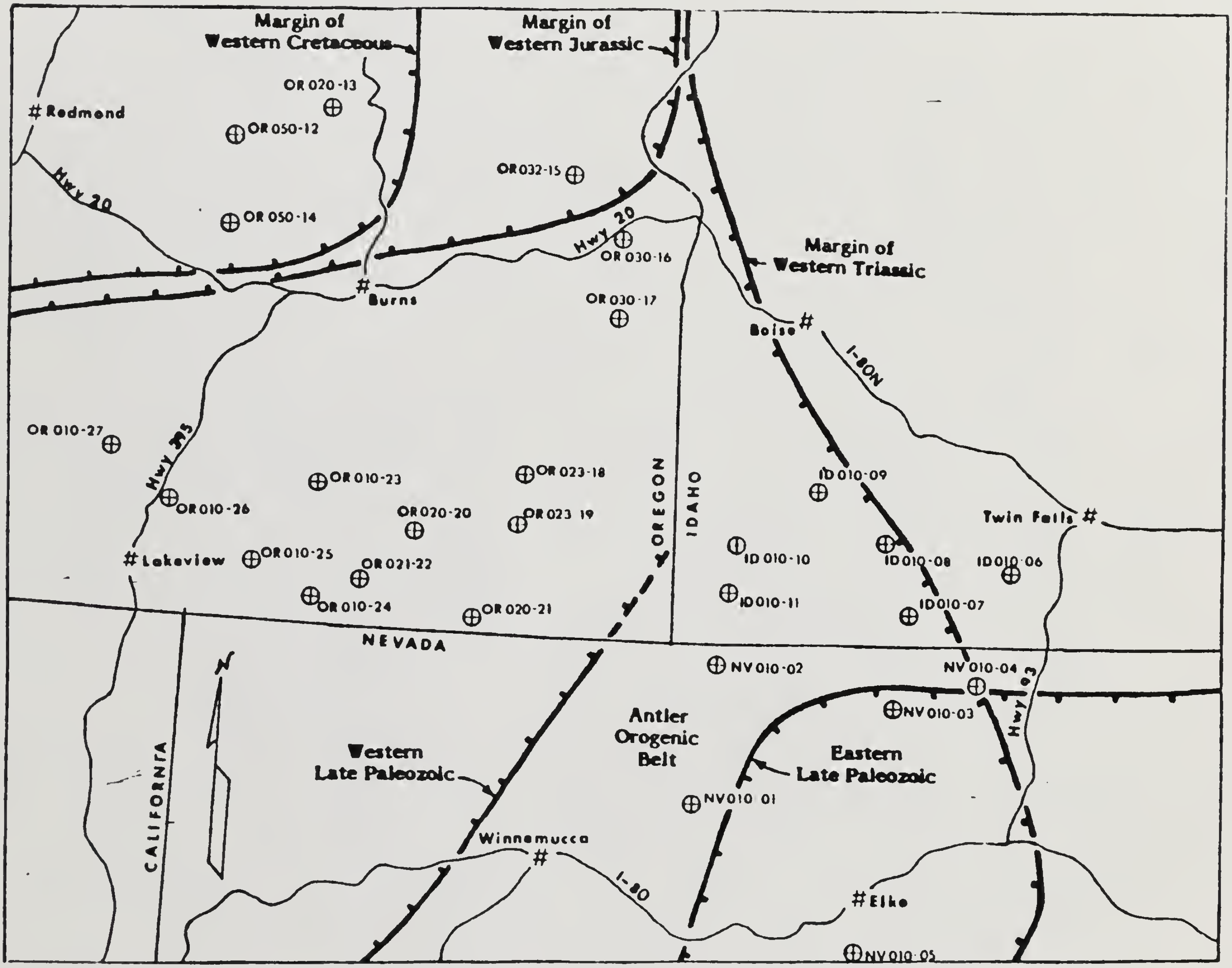
The present geologic character of the Great Basin resulted from the progressive development of the western portion of the North American continent throughout geologic time. Beginning in the Late Precambrian and continuing into the Middle Paleozoic, eastern Nevada, western Utah, and southwesternmost Idaho were characterized by a miogeoclinal environment in which shelf margin carbonates, shales, and sandstones were deposited. The Early Paleozoic strata in the Rough Hills GRA formed in this environment. In contrast, western Nevada and southern Oregon were in a eugeoclinal environment in which dark shales, radiolarian cherts and basaltic materials (Steinman's Trinity) were formed.

The Middle Paleozoic (Late Devonian-Early Mississippian) Antler Orogeny deformed and thrust the eugeoclinal sediments over the shelf-type sediments to the east, resulting in a north-trending highland in central Nevada. A vast amount of fine-grained detritus was shed eastward during the Mississippian, producing thick upper Paleozoic shales in eastern Nevada and western Utah. Erosion of the Antler Highlands resulted in the deposition of coarse sediments during the Early Pennsylvanian. Thousands of feet of sandstone and conglomerate were deposited in northern Nevada around the margins of the Antler Highlands. These strata are thin in the Rough Hills GRA because of the proximity of the GRA to the axis of the Antler Highlands. Late Pennsylvanian and Permian shallow-water sediments overlapped and overstepped the roots of the eroded highlands. Many of the rocks exposed in the Rough Hills GRA formed during this episode. Sediments deposited over the Antler Highlands in the Permian were predominantly of the deep-water variety. The next significant tectonic episode (the Sonoma Orogeny) thrust the ocean floor materials eastward over the shallow-water, clastic sedimentary rocks that covered the ancient Antler Highlands.

Development of western North America in the Mesozoic was dominated by oceanic plate subduction along the continental margin that resulted in a complex history of concomittant sedimentation, deformation, and igneous activity. During this time, the well-defined overthrust belt that extends from Canada to Mexico was formed. This deformation occurred during the Sevier (Late Jurassic to Late Cretaceous) and Laramide orogenies (Latest Cretaceous to Early Tertiary). Numerous granitic and grandioritic plutons were emplaced during the Mesozoic. These Jurassic and Cretaceous bodies are important in that they often are associated with mineralization. Thick outpourings of rhyolitic and basaltic materials occurred in this region in the Middle to Late Tertiary. These were associated with the widespread taphrogenic structural style of the Basin and Range.

FIGURE 2-3

Paleogeographic Map(6)
Oregon-Idaho-Nevada
Tri-State Area



2.3 ENVIRONMENTS FAVORABLE FOR GEM RESOURCES

The Rough Hills GRA is favorable to varying degrees for the occurrence of metallic resources, oil and gas, limestone, bentonite, barite, phosphate, silica, and paleontological resources. It is unfavorable for all other GEM resources.

2.3.1 Environments for Metals Resources

The Charleston, Alder, and Island Mountain Mining Districts lie within and near the Rough Hills GRA. The Alder District, northwest of the area, is an area of scheelite mineralization in skarn associated with a granodiorite intrusive. This environment does not exist within the GRA. Gold-bearing siliceous veins occur northeast of Charleston, Nevada. This area is highly favorable, however, a similar environment is not known to exist within the contained WSA. Potential for placer gold deposits may exist in tributaries of the Bruneau River that drain gold-bearing areas northwest of the GRA(7).

2.3.2 Environments for Oil and Gas Resources

The entire Rough Hills GRA has a low potential for the occurrence of oil and gas resources(6). There are some upper Paleozoic marine deposits in the area. Also, even though much of the area was above sea-level during much of the Mesozoic, there are marine Traissic rocks in the area. The Rough Hills GRA is within the limits of the Miocene Humboldt lacustrine deposits. The area is not currently leased or under lease application.

2.3.3 Environments for Oil Shale and Tar Sands Resources

The Rough Hills GRA contains no environments favorable for the occurrence of oil shale or oil impregnated sand(8). The area is underlain predominantly by Tertiary volcanics of felsic composition. Potential sedimentary hosts are largely tuffaceous and contain only minor amounts of non-volcanic clastic material and carbonates. Favorable lithologies are not present.

2.3.4 Environments for Geothermal Resources

There are no favorable geothermal environments within the Rough Hills GRA(9). There is no evidence of geothermal acitivity, no very young volcanics, and, although numerous small faults are present, there are no major faults in the area. The Rough Hills GRA is principally an upland area, whereas most geothermal resources in the Basin and Range Province are found in basin areas.

2.3.5 Environments for Uranium and Thorium Resources

The Rough Hills GRA contains no environments favorable for the occurrence of uranium or thorium(10). The GRA does not exhibit the necessary lithology, alteration, or geochemical recognition criteria that suggest the presence of environments that may be favorable for uranium or thorium. There are no uranium occurrences in or near the area. Although hydrothermal mineralization occurs in the area, there is no evidence that indicates the presence of associated uranium or thorium.

2.3.6 Environments for Coal Resources

The Rough Hills GRA contains low favorability for the occurrence of coal and lignite deposits(11). The chances for coal or carbonaceous materials to have formed in the study area are remote. The geology of the Rough Hills GRA region does not support environments favorable for the formation of coal deposits. Much of the area is underlain by marine carbonates or is mantled with accumulations of lavas and related volcanic products or has been modified by adjacent and subjacent igneous activity.

2.3.7 Environments for Industrial Minerals Resources

Three environments within the Rough Hills GRA are highly favorable for industrial minerals resources. The entire GRA is favorable for limestone and phosphate. Paleozoic rocks containing these resources are believed to underlie all but a small corner in the northeastern part of the GRA. Quartzites in the northeastern corner of the GRA are highly favorable for silica(12).

The entire Rough Hills GRA is moderately favorable for barite resources. This evaluation is based on the occurrence of barite replacements just north of the GRA. Inasmuch as the geology of the GRA (inferred at depth) is similar to the barite-bearing area to the north, the entire GRA is inferred to be favorable for similar occurrences.

The Rough Hills GRA has a low degree of favorability for bentonite. Bentonite develops through alteration of felsic volcanics and volcaniclastics. These rock types are abundant in the GRA. It is uncertain, however, whether the weathering processes have formed bentonite concentrations.

The Rough Hills GRA is not favorable for other industrial mineral resources.

2.3.8 Environments for Paleontological Resources

Paleontological assemblages that may occur within or near the Rough Hills GRA range from Early Paleozoic marine fauna to Tertiary non-marine fauna and flora. The Mississippian to Permian marine strata probably contain a miogeoclinal brachiopod-coral dominated assemblage(13). Plaeontological resources are lithology dependent. The presence of rhyolite and rhyodacite flows and domes in the WSA precludes the existence of plaeontological resources within the WSA.

2.3.9 Environments for Geologic Hazards

Potential geologic hazards in the Rough Hills GRA consist of faults, landslides, and/or volcanic centers(12). These features were noted from aerial photographs, geologic maps, and topographic maps. There is no historical record of violent seismic or volcanic activity in the area. The potential for mass movement exists along all oversteepened slopes within the Rough Hills GRA.

2.3.10 Educational and Scientific Localities

There are no known ESLs in the Rough Hills GRA.

3. ENERGY AND MINERAL RESOURCES IN THE ROUGH HILLS GRA

The Rough Hills GRA is moderately to highly favorable for the occurrence of metallic and industrial mineral GEM resources(7, 12). Specific commodities for which the area is favorable include gold, silver, tungsten, molybdenum, limestone, barite, phosphate, and silica. It is important to note that, although several of these commodities occur within the limits of the Rough Hills GRA, none are known to exist within WSA 010-151.

3.1 KNOWN DEPOSITS

WSA 010-151 contains no known deposits. The WSA is underlain by Tertiary felsic volcanic extrusives. Less than five percent of the area is underlain by Tertiary sedimentary rocks and Quarternary colluvial and landslide deposits. The thickness of the Tertiary units in the WSA is unknown. However, the total thickness of Tertiary units in the Charleston basin to the south of the WSA is estimated to be only 1,500 to 2,000 feet.

Three mining districts occur within five miles of the WSA. The Alder Mining District, to the northwest, contains tungsten and molybdenum (scheelite) mineralization in skarn zones within Paleozoic shales and limestones. This mineralization is directly related to the intrusion of the Paleozoic units by a Cretaceous granodiorite stock. The Charleston Mining District, to the east of the WSA, has produced gold from quartz veins in Paleozoic rocks and from placers derived from the mineralized areas. Minor amounts of silver, lead, antimony, and manganese also occurred in the veins. The Island Mountain Mining District, to the west of the WSA, produced lode-gold in quartz veins that were associated with a granodiorite stock. Accessory minerals included silver and arsenopyrite. Placers occurred in Pre-Quaternary gravels in the Island Mountain Mining District.

3.2 OCCURRENCES

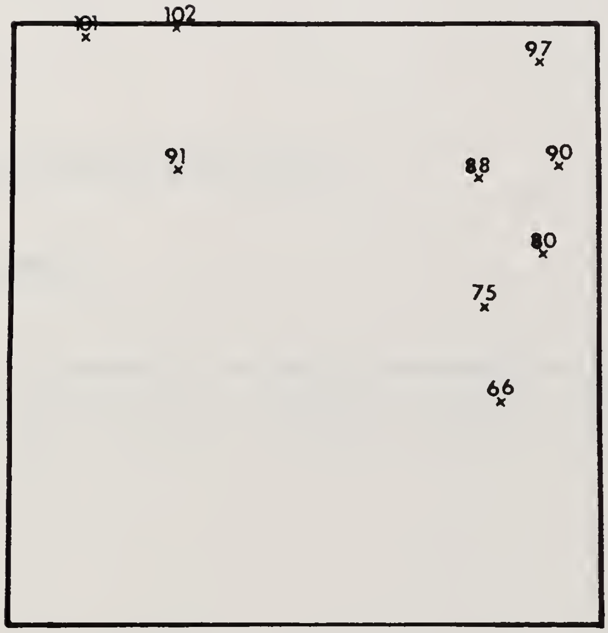
The Rough Hills GRA contains 27 MILS occurrences in nine clustered locations (Figure 3-1 and Appendix B). About one-third of the localities are for placer-gold operations; the remainder are underground mines. The Prunty Mines underground operation was producing as of April, 1976, and the Gold Standard #2 underground operation was producing as of January, 1977. The remaining localities are either past producers or of unknown status. The Rough Hills GRA contains no CRIB or NURE-related occurrences.

FIGURE 3-1

MILS Localities Map
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada

N

91
x = Site Keyed To Explanation



This map is an overlay for Figures 2-1 and 2-2.

Scale 1:250,000
(Wells 1^{o}x2^{o} NTMS Quadrangle)

3.3 CLAIMS

There are 274 claims within the Rough Hills GRA (Figure 3-2). The claims are primarily clustered in Paleozoic units in the northwest and northeast corners of the area. None of the claims are within the boundaries of WSA 010-151. Claims information is current as of 15 August, 1982.

3.4 LEASES

There are no leases or lease applications in the Rough Hills GRA. Lease information is current as of 15 August, 1982.

3.5 DEPOSIT TYPES

There are no known deposits within WSA 010-151.

3.6 MINERAL ECONOMICS

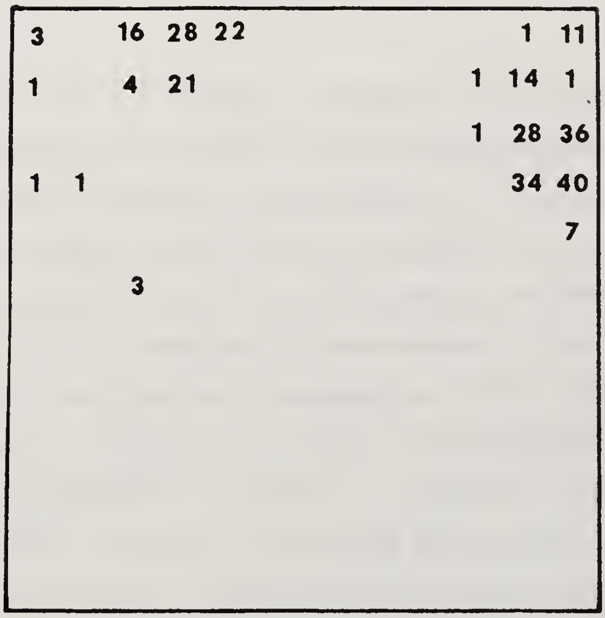
The Rough Hills GRA is moderately to highly favorable for gold, silver, tungsten, molybnedum, copper, lead, antimony, limestone, phosphate, silica, and barite GEM resources.

3.6.1 Gold

Jewelry and the arts are estimated to have consumed 54 percent of all the gold used in the United States in 1981. Other consumers include electronic industries, 37 percent; dental, eight percent; and investments, one percent(14). In 1981, 25 mines in the western United States yielded 94 percent of the domestic gold production(15). Nearly 40 percent of the domestic gold production was recovered as a by-product of base metal (chiefly copper) mining. The United States had a net import reliance equal to seven percent of apparent consumption in 1981. Import reliance has decreased steadily to the present level since a high of 61 percent in 1977. Gold prices that reached record levels in January, 1980, declined from $597.00 per troy ounce at the beginning of 1981 to a low of $391.00 in August, 1981. August, 1982 prices averaged $367.00 per troy ounce.

FIGURE 3-2

Claims Density Map
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada



n = number of claims per section

This map is an overlay for Figures 2-1 and 2-2.

Scale 1:250,000
(Wells $1^{o}x2^{o}$ NTMS Quadrangle)

United States consumption of gold increased slightly from 1980 to 1981. It is estimated that 1982 domestic mine production of gold will be 1.6 million troy ounces whereas United States consumption will be about five million troy ounces(15). As of July, 1982, domestic mine production totaled about 730,000 troy ounces(16). Recycled scrap produced 3.9 million troy ounces of gold in 1981. Similar production is anticipated in 1982. Total demand for gold in the United States is expected to increase at an annual rate of about 2.2 percent through 1990(15).

3.6.2 Silver

The photographic industry is the largest consumer of silver in the United States, accounting for about 35 percent of the total United States consumption(17). Other major uses include electrical and electronic components, 29 percent; sterling-ware, ten percent; alloys and solders, eight percent; and miscellaneous uses, 18 percent. About 55 percent of the domestic production comes from by-product processes of copper, lead, and zinc mining. Estimated domestic mine production of silver in 1982 will be 42 million troy ounces, whereas United States apparent consumption will be 150 million troy ounces. United States consumption in 1981 was about four times domestic mine production, and 39 percent of world production(18). About 37 percent of the total United States consumption of silver in 1981 was met by recycling scrap silver. This left a deficit net import reliance of 50 percent of the United States silver consumption in 1981. Estimated year-end stocks for 1981 totalled 163.8 million troy ounces. The demand for silver is expected to increase at a rate of about three percent through 1990(19). The average daily price of silver in 1981 was about $11.00 per troy ounce, down about 50 percent from 1980. The price of silver futures at the end of July, 1982, was $6.96 (December, 1982), and is expected to be $7.50 (July, 1982), and $8.12 (March, 1984)(19). Future United States requirements will be met by increased reliance on imports, secondary recovery, and withdrawal from existing stockpiles.

3.6.3 Tungsten

Tungsten is used in many different industries. The most dominant use is in metalworking and machinery, with 78 percent of the United States tungsten consumption; followed by lamps, lighting, and electrical with ten percent; transportation with nine percent; and a variety of other industries consuming three percent of the United States annual tungsten production. Tungsten production in the United States for 1981 was 22 million pounds. Estimated total domestic mine production was about seven million pounds. Purchased scrap metal accounted for nearly 3.5 million pounds of tungsten. The United States import reliance in 1981 is estimated to have been 52 percent of the apparent consumption(20). Domestic consumption of tungsten concentrate decreased nearly 76 percent from July, 1981 to July, 1982. Imports decreased 45 percent in the same period. Reported production and consumption of ammonium paratungstate decreased 72 percent and 64 percent respectively, between July, 1981 and July, 1982(21).

The price of tungsten concentrate in August, 1982, was about $92.00 to 96.00 per short ton unit of WO_3. The General Services Administration offerings in August and September, 1982, of one million pounds of tungsten were not bid. One 1982 estimate predicts a five percent increase in tungsten consumption through 1990(22).

3.6.4 Molybdenum

Molybdenum is used primarily in metallurgical applications, in catalysts, in lubricants, and in pigments(23). Domestic and foreign production of molybdenum exceeded demand in 1981. Consumption in raw materials and apparent domestic demand declined six percent and three percent respectively, relative to the 1980 supply and demand. Worldwide demand fell by an estimated five to ten percent. This caused an increase in domestic producer stockpiles of nearly 175 percent. Domestic production of molybdenum concentrate fell 68 percent in July, 1982, compared with the previous month(24). Year-to-date total consumption fell about 60 percent by July, 1982. It is estimated that in 1982 total domestic mine production of molybdenum will be 147 million pounds, whereas the United States apparent consumption will be 57 million pounds. The United States will be a net exporter of molybdenum(25). The price of molybdenum has decreased from $9.70 per pound to $6.85 per pound since 1981.

3.6.5 Copper

The principal consumers of copper in 1981 were the electrical industry, 57 percent; and the construction industry, 17 percent. Twelve percent of consumption was in industrial machinery; eight percent was used in transportation, and six percent went for other uses. Copper mining and the refining of copper ores have produced the entire domestic supply of primary arsenic, selenium, and tellurium, most of the primary platinum and palladium, nearly 43 percent of the primary gold, 37 percent of the primary silver, and 30 percent of the primary domestic molybdenum(26).

Domestic production of copper fell six percent in July, 1982, whereas net imports declined 17 percent in the same month. This is 14 percent below the July, 1981 level(27). Consumption of refined copper decreased 24 percent while stockpiles have increased six percent. The price of copper reached an all time high of $1.45 per pound in February, 1980. Although the price has fluctuated, it has declined steadily to around $0.63 to $0.71 per pound in August, 1982(28).

The United States demand for copper is expected to increase at an annual rate of about three percent through 1990(27). The United States is estimated to have a net import reliance of five percent of apparent copper consumption, as of January, 1982.

3.6.6 Lead

Nearly 65 percent of domestic lead consumption is related to the transportation industry: batteries, gasoline additives, etc. Construction, paints, ammunition, and electical supplies consume another 30 percent. The remainder goes into ceramics, glass, type metal, and other minor uses. Total apparent United States consumption in 1981 was estimated to be 950,000 metric tons(29). Mine production was about 450,000 metric tons. Recovery from scrap supplied 44 percent of reported consumption. In 1980, the United States was a net exporter of lead. In 1981, the United States is estimated to have an import reliance of nearly ten percent of apparent consumption. Estimated 1982 domestic mine production is 525,000 metric tons to satisfy an estimated total United States consumption of 970,000 metric tons. Demand for lead is expected to increase at an annual rate of 2.5 percent through 1990(29). The price of lead has varied between $0.30 per pound and $0.45 per pound since 1977.

3.6.7 Antimony

The principal uses of antimony in 1981, were flame retardents, 55 percent; transportation, 15 percent; ceramics and glass, 15 percent; chemicals, five percent; and miscelaneous, ten percent. The estimated 1981 United States mine production was 700 short tons. Nearly all domestic production of antimony was in Idaho and Montana. The estimated 1981 United States apparent consumption was 36,400 short tons. Antimony production also comes from primary and secondary processes. About 47 percent of the apparent 1981 consumption was derived from recycling scrap. The United States has a net import reliance of 51 percent of the apparent consumption. The price of anitmony metal has ranged from $.75 per pound to about $2.00 per pound since 1978. The demand for antimony is expected to increase at an annual rate of 3.1 percent through 1990(30).

3.6.8 Limestone

Lime, limestone, and calcined gypsum, are used primarily in steel furnaces, water treatment, Portland cement, paper and pulp, and in the desulfurization of sour gas. Ohio, Pennsylvania, Missouri, Illinois, Texas, Alabama, and Kentucky produce 47 percent of the total output(31, 32). Although the United States production of lime has increased nearly 14 percent in the last 12 months, it is predicted to increase at an annual rate of two and one-half percent through 1990(31). The lime market has expanded largely because of environmental regulation of industrial effluents and emissions. Estimated United States consumption of lime will exceed domestic production by 300,000 tons in 1982. Foreign sources of industrial lime products are Canada, 94 percent; and Mexico, six percent. The current average price for lime is $47.00 per ton.

3.6.9 Phosphate

The principal uses of phosphate rock are as fertilizers and animal feed supplements, 88 percent; and industrial and food grade products, 12 percent(33). The majority (83 percent) of total domestic production came from Florida. Production of phosphate rock for the first eight months of 1982 (annual rate 38.4 million metric tons) was 28 percent lower than in 1981 (annual rate 53.6 million metric tons). Consumption was down 17 percent for the same period.

The United States is a net exporter of phosphate(34). Average prices of phosphate rock have ranged from about $17.00 per metric ton in 1977 to an estimated $27.00 per metric ton in 1981. The average price for the first six months of 1982 was about $22.00 per metric ton(35).

3.6.10 Barite

Barite is used almost exclusively (97 percent) in oil and gas well drilling fluids(36). Other uses include glass manufactories, and paint, plastics, rubber, flux and oxidizer operations. Domestic production of barite in 1981 rose to a record level of 2.4 million tons. This reflects the increased oil and gas drilling activities in 1981. Apparent consumption for

1981 was 4.2 million tons. Since 1977, the United States has had a net import reliance that varied from 28 percent to 44 percent of the total apparent consumption. The price of barite has varied from about $20.00 per ton in 1977 to $35.50 per ton in 1981(37). The price, supply and demand for barite will continue to be directly related to oil and gas drilling activity.

3.6.11 Silica

Silica, as a naturally occurring GEM resource, is distinguished from sand and gravel resources. Silica sand is used in abrasives, glass and chemical, metallurgical, refractory, and other miscellaneous applications. Due to the fact that unit values are relatively low as compared to transportation costs, the economics of industrial silica resources are a function of the proximity of consumer and producer. The silica reserve base in the United States is ample in relation to demand. Quantitative estimates of reserves are not available(44).

3.7 STRATEGIC AND CRITICAL MINERALS AND METALS

Strategic and critical minerals and metals for which the Rough Hills GRA is favorable include, antimony, copper, lead, silver, and tungsten as listed in the BLM-supplied compilation given in Table 3-4 of the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources." The Rough Hills GRA is classified moderately to highly favorable for these commodities(7).

4. CLASSIFICATION OF LAND FOR GEM RESOURCES POTENTIAL

The precise location of specific favorable environments within a given GRA depends upon three principal factors:

- The precision and specificity of avaliable data;
- The nature (size and spatial distribution) of anticipated deposits as predicted from known models; and
- The geometry of the favorable geologic environments.

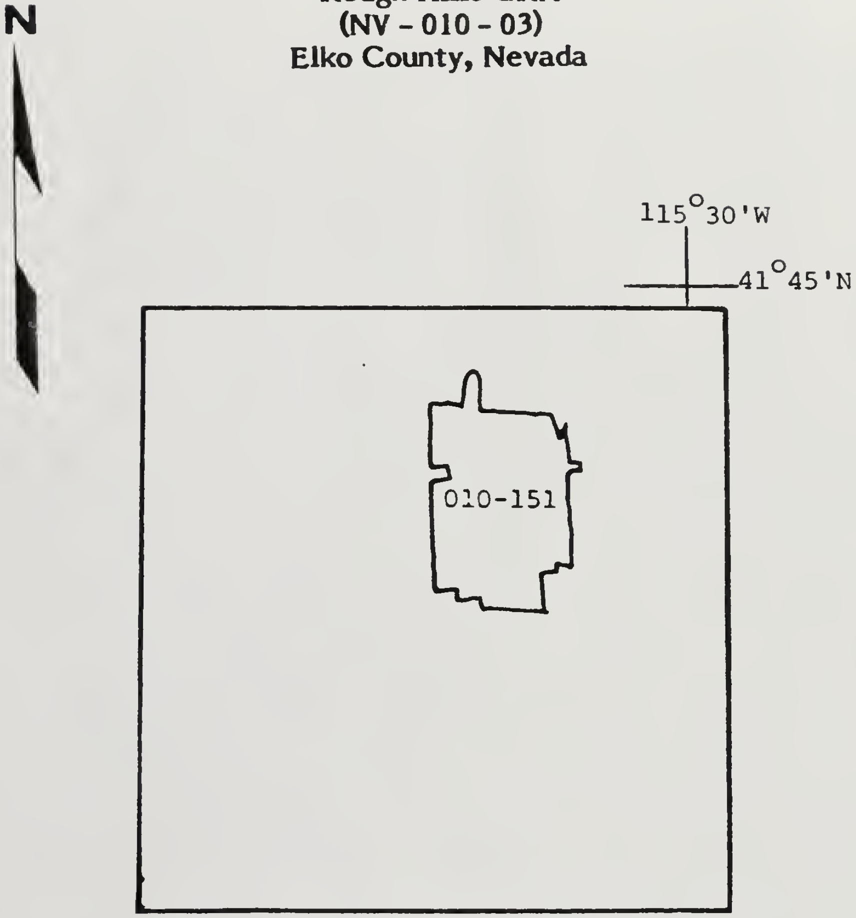
Information in the Rough Hills GRA is limited to areas that are perpherial to the contained WSA. Sub-surface information in areas of Tertiary cover is essentially non-existent. Therefore, the entire area rather than specific subareas has been classified for individual GEM resources (Figure 4-1 and Table 4-1).

The Rough Hills GRA is highly favorable (Class 4) for metals, limestone, phospate, silica, and barite(7, 12). The classification of the area for metallic resources is 4D. Vein-type metallic deposits that are associated with intrusive stocks occur in mining districts situated along three sides of the GRA. Although it is entirely reasonable to infer that the same environment may occur at depth within the WSA, there is no direct evidence to support this contention. Metals that have been produced from surrounding disticts include gold, silver, copper, lead, tungsten, molybdenum, and antimony.

The Rough Hills GRA is classified highly favorable (Class 4D) for limestone and phosphate GEM resources signifying that the geologic environments, inferred geologic processes, and reported occurrences (mines or deposits) provide strong support for the favorability of these resources. The high confidence level (D) stems from the fact that Paleozoic formations that are known to contain these resources are present within the GRA. Pre-Cambrian quartzites in the GRA are highly favorable (Class 4C) for potential silica resources. The area is highly favorable because geologic environments containing potential resources are known to occur. Although the available data do not provide direct evidence, the area is classified moderately favorable (Class 3A) for barite resources because the commodity occurs in townships just north of the GRA(12).

FIGURE 4-1

Land Classification Map
Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada



This map is an overlay for Figures 2-1 and 2-2.

Scale 1:250,000
(Wells 1^{o}x2^{o} NTMS Quadrangle)

TABLE 4-1

Classification Of Lands Within The Rough Hills GRA
(NV - 010 - 03)
Elko County, Nevada
For GEM Resource Potential

COMMODITY	AREA	CLASSIFICATION LEVEL	CONFIDENCE LEVEL	REMARKS
Metals	Entire GRA	4	D	Au, Ag, Pb, W, Mo, Sb, Cu.
Geothermal	Entire GRA	1	C	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	1	C	
Oil and Gas	Entire GRA	2	B	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	4	D	
Bentonite	Entire GRA	2	A	
Diatomite	Entire GRA	1	B	
Clinoptilolite	Entire GRA	1	B	
Barite	Entire GRA	3	A	
Silica	Entire GRA	4	C	
Phosphate	Entire GRA	4	D	
Paleontology	Entire GRA	2	A	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:
Class 1 - Least Favorable
Class 2 - Low Favorability
Class 3 - Moderate Favorability
Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
Confidence Level B - Indirect evidence available
Confidence Level C - Direct evidence but quantitatively minimal
Confidence Level D - Abundant direct and indirect evidence

The entire Rough Hills GRA has a low favorability (Class 2) for oil and gas(6), bentonite(12), and paleontological(13) GEM resources. Confidence levels for these commodities are A or B signifying that the available data are either insufficient or too indirect to substantiate or refute the classifications. The entire Rough Hills GRA is not considered favorable for all other GEM resources.

TERRADATA's classification of the Rough Hills GRA for leasable resources agrees with the USGS classification of the area for the same GEM resources(38, 39, 40, 41, 42, 43).

5. RECOMMENDATIONS FOR FUTURE WORK

TERRADATA recommends that geophysical surveys be performed to make a more precise determination of the thickness of Tertiary units in WSA 010-151. Selective drilling may be desirable where geophysical surveys suggest appropriate targets, particularly margins of concealed intrusives or shallow features that may indicate sites for fossil placers. Prior to any final land-use decision, further investigations should be conducted to enhance the confidence levels of the ratings given to the potential strategic and critical commodities for which this GRA is favorable.

- APPENDIX A -

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42. Godwin, L.H., and Dokter, R.; 1981; Lands Valuable for Coal Map for the State of Nevada; Revised, United States Geological Survey, Mineral Management Service, Menlo Park, California, Scale 1:250,000.

43. Lee, Robert E.; 1980; Lands Valuable for Oil Shale Map for the State of Nevada; Revised, United States Geological Survey, Mineral Management Service, Menlo Park, California, Scale 1:250,000.

44. Murphy, G.; 1982; Silicon; in Mineral Commodity Summaries, United States Department of the Interior, United States Bureau of Mines, pp.18.

- APPENDIX B -

Explanation For Figure 3-1

FIGURE 3-1

(Explanation)

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  111
66 NAME- MEMPHIS                                  REFERENCE NUMBER- 0320070560
   STATE- NEVADA                 COUNTY- ELKO                          ELEV:PREC- 1829M:100M
   LATITUDE-   N 41 37 52        PRECISION-   1KM
   LONGITUDE- W 115 31 15  REFERENCE POINT- ORE BODY
   UTM:  ZONE 11N  NORTHING 4609663  EASTING 623211
   PUBLIC LAND SURVEY  TOWNSHIP- 043 N   RANGE- 057 E
       DESCRIPTION     SECTION- 10  SECTION SUBDIVISION-
   RIVER BASIN- 78D                                  DOMAIN- PRIVATE
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.            YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- MEMPHIS
   OTHER NAMES-  SLATTERY
   COMMOD/MOD-  GOLD                                        SILVER
                COPPER
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     U.S. GEOL. SURVEY.. OPEN-FILE REPORT 1976-56. 1976, P. 37.

  120
75 NAME- BLACK WARRIOR MINE                       REFERENCE NUMBER- 0320070468
   STATE- NEVADA                 COUNTY- ELKO                          ELEV:PREC- 1829M:500M
   LATITUDE-   N 41 39 30        PRECISION-   1KM
   LONGITUDE- W 115 31 37  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4612677  EASTING 622650
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION     SECTION- 13  SECTION SUBDIVISION-
   RIVER BASIN- 78A  BRUNEAU RIVER                   DOMAIN- NAT FOREST
   STATUS- UNKNOWN        OPERATION TYPE- UNDERGROUND
   MESA ID NO.            YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- BLACK WARRIOR MINE
   COMMOD/MOD-  ANTIMONY                                    COPPER
                GOLD
   NEV.BUR.OF MINES BULL.61,1963,P.43,PL.1

  136
80 NAME- DAVENPORT                                REFERENCE NUMBER- 0320070558
   STATE- NEVADA                 COUNTY- ELKO                          ELEV:PREC- 1875M:100M
   LATITUDE-   N 41 40 28        PRECISION-   1KM
   LONGITUDE- W 115 30 16  REFERENCE POINT- TOWN
   UTM:  ZONE 11N  NORTHING 4614498  EASTING 624492
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION     SECTION- 26  SECTION SUBDIVISION-
   RIVER BASIN- 78A                                  DOMAIN- PRIVATE
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.            YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- DAVENPORT
   COMMOD/MOD-  COPPER                                      GOLD
                SILVER
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FIGURE 3-1

(Explanation Continued)

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  137
80 NAME- LOG CABIN PLACER                     REFERENCE NUMBER- 0320070559
   STATE- NEVADA                COUNTY- ELKO                    ELEV:PREC- 1875M:100M
   LATITUDE-    N 41 40 28     PRECISION-    1KM
   LONGITUDE- W 115 30 16  REFERENCE POINT- TOWN
   UTM:  ZONE 11N  NORTHING 4614498  EASTING 624492
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 26  SECTION SUBDIVISION-
   RIVER BASIN- 78A                              DOMAIN- PRIVATE
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.          YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA            TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE-
   PRIMARY NAME- LOG CABIN PLACER
   COMMOD/MOD-  GOLD
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     U.S. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 37.

  138
80 NAME- WESTON PLACER                        REFERENCE NUMBER- 0320070563
   STATE- NEVADA                COUNTY- ELKO                    ELEV:PREC- 1875M:100M
   LATITUDE-    N 41 40 28     PRECISION-    1KM
   LONGITUDE- W 115 30 16  REFERENCE POINT- TOWN
   UTM:  ZONE 11N  NORTHING 4614498  EASTING 624492
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 26  SECTION SUBDIVISION-
   RIVER BASIN- 78A                              DOMAIN- PRIVATE
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.          YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA            TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE-
   PRIMARY NAME- WESTON PLACER
   COMMOD/MOD-  GOLD                                       SILVER
   SMITH. ROSCOE M. MINERAL RESOURCES OF ELKO COUNTY, NEVADA.
     U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 37.

  150
86 NAME- MCKNIGHTS PLACER MINE                REFERENCE NUMBER- 0320070124
   STATE- NEVADA                COUNTY- ELKO                    ELEV:PREC- 1874M:500M
   LATITUDE-    N 41 41 46     PRECISION-    1KM
   LONGITUDE- W 115 31 45  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4616868  EASTING 622394
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 22  SECTION SUBDIVISION- N2
   RIVER BASIN- 78A   BRUNEAU RIVER              DOMAIN- UNKNOWN
   STATUS- UNKNOWN        OPERATION TYPE- PLACER
   MESA ID NO.          YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA            TYPE- 15 MIN
   1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE-
   PRIMARY NAME- MCKNIGHTS PLACER MINE
   COMMOD/MOD-  GOLD
   NEV BUR OF MINES, BULL. 68, 1967, PT. 1.
```

FIGURE 3-1

(Explanation Continued)

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  152
90 NAME- BOUNTY CLAIM                                 REFERENCE NUMBER- 0320070469
   STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 2012M:500M
   LATITUDE-    N 41 42 05         PRECISION-    1KM
   LONGITUDE- W 115 29 33  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4617506  EASTING 625435
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 13  SECTION SUBDIVISION-
   RIVER BASIN- 78A   BRUNEAU RIVER                 DOMAIN- NAT FOREST
   STATUS- UNKNOWN          OPERATION TYPE- UNDERGROUND
   MESA ID NO.        ,    YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MARYS RIVR BSN NW  TYPE- 7.5 MIN
   1:250,000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- BOUNTY CLAIM
   COMMOD/MOD-  ANTIMONY
   NEV.BUR.OF MINES BULL.61,1953,P.43,PL.1

  153
90 NAME- CLEAVLAND                                    REFERENCE NUMBER- 0320070550
   STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 1981M:100M
   LATITUDE-    N 41 42 26         PRECISION-    1KM
   LONGITUDE- W 115 30 34  REFERENCE POINT- ORE BODY
   UTM:  ZONE 11N  NORTHING 4618130  EASTING 624013
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 14  SECTION SUBDIVISION-
   RIVER BASIN- 78A                                 DOMAIN- NAT FOREST
   STATUS- UNKNOWN          OPERATION TYPE- UNKNOWN
   MESA ID NO.             YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- CLEAVLAND
   COMMOD/MOD-  LEAD                                           SILVER
                COPPER                                         GOLD
   U.S. BUREAU OF MINES. PERMANENT INDIVIDUAL MINE PRODUCTION
     RECORD FILE. WESTERN FIELD OPERATIONS CENTER, SPOKANE, WA.
     P.38.
   SMITH, ROSCOE M. MINERAL RESOURCES OF ELKO COUNTY, NEVADA.
     U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 37.

  154
90 NAME- GRAHAM MINE                                  REFERENCE NUMBER- 0320070150
   STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 2024M:500M
   LATITUDE-    N 41 41 57         PRECISION-  500M
   LONGITUDE- W 115 29 54  REFERENCE POINT- APPROX
   UTM:  ZONE 11N  NORTHING 4617251  EASTING 624953
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 24  SECTION SUBDIVISION- NW
   RIVER BASIN- 68C   SOUTH FORK HUMBOLT RIVER   DOMAIN- UNKNOWN
   STATUS- UNKNOWN          OPERATION TYPE- UNDERGROUND
   MESA ID NO.             YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MARYS RIVR BSN NW  TYPE- 7.5 MIN
   1:250,000 MAP NAME- WELLS                    MINERAL PROPERTY FILE-
   PRIMARY NAME- GRAHAM MINE
   COMMOD/MOD-  COPPER                                         GOLD
   ABT 4 MI N OF CHARLESTON, FEW HUNDRED FT WEST OF 76 CREEK.
   NEV BUR OF MINES BULL.61, 1963, P.43, PL.1.
   NEV BUR OF MINES BULL.54, 1957, P.32-33.
   USGS BULL.741, 1923, P.82, FIG.19.
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FIGURE 3-1

(Explanation Continued)

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  155
90 NAME- PRUNTY MINES                             REFERENCE NUMBER- 0320070365
   STATE- NEVADA                    COUNTY- ELKO                           ELEV:PREC- 2024M:500M
   LATITUDE-    N 41 42 04         PRECISION-   100M
   LONGITUDE- W 115 29 54  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4617468  EASTING 624950
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 13  SECTION SUBDIVISION- SWSWSW
   RIVER BASIN- 6BC   SOUTH FORK HUMBOLT RIVER   DOMAIN- NAT FOREST
   STATUS- PRODUCER        OPERATION TYPE- UNDERGROUND
   MESA ID NO. 26 01261  YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MARYS RIVR BSN NW  TYPE- 7.5 MIN
   1:250,000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
   PRIMARY NAME- PRUNTY MINES
   COMMOD/MOD-  GOLD                                              SILVER
   ON SEVENTY-SIX CREEK ABT. 1/3 MI. ABOVE, GRAHAM MINE
   NEV. INDUS. COMM. DIR. OF ACTIVE NEV. MINE OPS, APRIL, 1976,
   NEV. BUR. OF MINES BULL. 54, 1957, P.3
   USGS BULL. 741, 1923, P. 82, FIG. 19

  156
90 NAME- RESCUE MINE                              REFERENCE NUMBER- 0320070470
   STATE- NEVADA                    COUNTY- ELKO                           ELEV:PREC- 1981M:500M
   LATITUDE-    N 41 42 25         PRECISION-    1KM
   LONGITUDE- W 115 30 31  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4618100  EASTING 624083
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 14  SECTION SUBDIVISION-
   RIVER BASIN- 78A   BRUNEAU RIVER               DOMAIN- NAT FOREST
   STATUS- UNKNOWN         OPERATION TYPE- SURF-UNDERG
   MESA ID NO.             YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
   PRIMARY NAME- RESCUE MINE
   OTHER NAMES-  KAFF-ROCK MINE
   COMMOD/MOD-  ANTIMONY
   NEV.BUR.OF MINES BULL.61,1963,P.44,PL.3

  157
90 NAME- VANITY FAIR                              REFERENCE NUMBER- 0320070561
   STATE- NEVADA                    COUNTY- ELKO                           ELEV:PREC- 2054M:100M
   LATITUDE-    N 41 41 56         PRECISION-    1KM
   LONGITUDE- W 115 30 10  REFERENCE POINT- ORE BODY
   UTM:  ZONE 11N  NORTHING 4617214  EASTING 624584
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION      SECTION- 23  SECTION SUBDIVISION-
   RIVER BASIN- 78A                               DOMAIN- NAT FOREST
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.             YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA              TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
   PRIMARY NAME- VANITY FAIR
   COMMOD/MOD-  GOLD                                              SILVER
                COPPER
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     U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 37.
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FIGURE 3-1

(Explanation Continued)

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  158
90 NAME- VIRGINIA                              REFERENCE NUMBER- 0320070562
   STATE- NEVADA                   COUNTY- ELKO                        ELEV:PREC- 2051M:100M
   LATITUDE-   N 41 41 56        PRECISION-   1KM
   LONGITUDE- W 115 30 10  REFERENCE POINT- ORE BODY
   UTM:  ZONE 11N  NORTHING 4617214  EASTING 624584
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION     SECTION- 23  SECTION SUBDIVISION-
   RIVER BASIN- 78A                              DOMAIN- NAT FOREST
   STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
   MESA ID NO.          YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
   MAP NAME- CONTACT             TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
   PRIMARY NAME- VIRGINIA
   COMMOD/MOD-   GOLD                                     SILVER
                 COPPER.                                  LEAD
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     U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 37.

  159
91 NAME- SAINT ELMO MINE                       REFERENCE NUMBER- 0320070849
   STATE- NEVADA                   COUNTY- ELKO                        ELEV:PREC- 2285M: 10M
   LATITUDE-   N 41 41 55        PRECISION-   5KM
   LONGITUDE- W 115 38 40  REFERENCE POINT- MAIN ENT
   UTM:  ZONE 11N  NORTHING 4616988  EASTING 612796
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
       DESCRIPTION     SECTION-     SECTION SUBDIVISION-
   RIVER BASIN- 78F   SOU FK OWYHEE RIVER        DOMAIN- UNKNOWN
   STATUS- PAST PRODUCER  OPERATION TYPE- UNDERGROUND
   MESA ID NO.          YEAR FIELD CHECKED-      MAP REPOSITORY- WFOC
   MAP NAME- MT VELMA            TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
   PRIMARY NAME- SAINT ELMO MINE
   COMMOD/MOD-   GOLD
   WFOC MINE MAP REPOSITORY

  166
97 NAME- SEVENTY-SIX CREEK PLACERS             REFERENCE NUMBER- 0320070152
   STATE- NEVADA                   COUNTY- ELKO                        ELEV:PREC- 2286M:500M
   LATITUDE-   N 41 43 47        PRECISION-   5KM
   LONGITUDE- W 115 30 21  REFERENCE POINT- APPROX
   UTM:  ZONE 11N  NORTHING 4620633  EASTING 624270
   PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 057 E
       DESCRIPTION     SECTION- 02  SECTION SUBDIVISION-
   RIVER BASIN- 78A   BRUNEAU RIVER              DOMAIN- UNKNOWN
   STATUS- UNKNOWN        OPERATION TYPE- PLACER
   MESA ID NO.          YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
   MAP NAME- MT VELMA            TYPE- 15 MIN
   1:250,000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
   PRIMARY NAME- SEVENTY-SIX CREEK PLACERS
   COMMOD/MOD-   GOLD
   NEV. BUR. OF MINES BULL. 54, 1957, P.33
   ON W SIDE OF 76 CREEK ABT 4 MI ABOVE CHARLESTON
```

FIGURE 3-1

(Explanation Continued)

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   175
101 NAME- GOLD CREEK PLACERS                      REFERENCE NUMBER- 0320070695
    STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 2012M:100M
    LATITUDE-   N 41 44 12           PRECISION-   1KM
    LONGITUDE- W 115 40 48  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621168  EASTING 609772
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION      SECTION- 05  SECTION SUBDIVISION-
    RIVER BASIN- 78F                                 DOMAIN- PRIVATE
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA               TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
    PRIMARY NAME- GOLD CREEK PLACERS
    COMMOD/MOD-  GOLD                                              SILVER
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   176
102 NAME- BERTIE LEE AND GOLD PAN PLACER          REFERENCE NUMBER- 0320070690
    STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21           PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION      SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                                 DOMAIN- NAT FOREST
    STATUS- UNKNOWN          OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA               TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
    PRIMARY NAME- BERTIE LEE AND GOLD PAN PLACER
    COMMOD/MOD-  GOLD                                              SILVER
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      U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 87.

   177
102 NAME- BLACKBIRD GROUP PLACER                  REFERENCE NUMBER- 0320070691
    STATE- NEVADA                     COUNTY- ELKO                          ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21           PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION      SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A   BRUNEAU RIVER                 DOMAIN-
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA               TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                   MINERAL PROPERTY FILE-
    PRIMARY NAME- BLACKBIRD GROUP PLACER
    OTHER NAMES-  TAILS
    COMMOD/MOD-  GOLD
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      U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 88.
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FIGURE 3-1

(Explanation Continued)

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   178
102 NAME- GOLD CENTRE                          REFERENCE NUMBER- 0320070694
    STATE- NEVADA                  COUNTY- ELKO                        ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21        PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                              DOMAIN- NAT FOREST
    STATUS- UNKNOWN        OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
    PRIMARY NAME- GOLD CENTRE
    COMMOD/MOD-  GOLD                                      SILVER
                 COPPER                                    LEAD
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      U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 87.

   179
102 NAME- GOLD ORE                             REFERENCE NUMBER- 0320070696
    STATE- NEVADA                  COUNTY- ELKO                        ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21        PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                              DOMAIN- NAT FOREST
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
    PRIMARY NAME- GOLD ORE
    COMMOD/MOD-  GOLD                                      SILVER
                 COPPER
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      U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 87.

   180
102 NAME- GOLD STANDARD #2                     REFERENCE NUMBER- 0320070462
    STATE- NEVADA                  COUNTY- ELKO                        ELEV:PREC- 2438M:500M
    LATITUDE-   N 41 44 07        PRECISION-   1KM
    LONGITUDE- W 115 38 37  REFERENCE POINT- APPROX
    UTM:  ZONE 11N  NORTHING 4621060  EASTING 612801
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78F   SOU FK OWYHEE RIVER        DOMAIN- NAT FOREST
    STATUS- PRODUCER       OPERATION TYPE- UNDERGROUND
    MESA ID NO. 26 01357  YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS               MINERAL PROPERTY FILE-
    PRIMARY NAME- GOLD STANDARD #2
    COMMOD/MOD-  GOLD
    NEV INDUS COMM DIR OF ACT NEV MINE OPS,JAN 31,1977,P.14
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FIGURE 3-1

(Explanation Continued)

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   181
102 NAME- LONESOME                             REFERENCE NUMBER- 0320070068
    STATE- NEVADA                  COUNTY- ELKO                    ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21        PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                              DOMAIN- NAT FOREST
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS              MINERAL PROPERTY FILE-
    PRIMARY NAME- LONESOME
    COMMOD/MOD-  GOLD                                       SILVER
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   182
102 NAME- MINK MINE                            REFERENCE NUMBER- 0320070121
    STATE- NEVADA                  COUNTY- ELKO                    ELEV:PREC- 2133M:100M
    LATITUDE-   N 41 44 41        PRECISION-   5KM
    LONGITUDE- W 115 39 23  REFERENCE POINT- APPROX
    UTM:  ZONE 11N  NORTHING 4622092  EASTING 611723
    PUBLIC LAND SURVEY  TOWNSHIP- 045 N   RANGE- 050 E
        DESCRIPTION     SECTION- 33  SECTION SUBDIVISION-
    RIVER BASIN- 78A   BRUNEAU RIVER              DOMAIN- UNKNOWN
    STATUS- UNKNOWN     OPERATION TYPE- MINERAL LOC
    MESA ID NO.           YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS              MINERAL PROPERTY FILE-
    PRIMARY NAME- MINK MINE
    COMMOD/MOD-  GOLD
    NEV BUR OF MINES BULL.68,1967,P.19
    AT HEAD OF ROSEBUD CREEK

   183
102 NAME- ORO FINO                             REFERENCE NUMBER- 0320070700
    STATE- NEVADA                  COUNTY- ELKO                    ELEV:PREC- 2362M:100M
    LATITUDE-   N 41 44 21        PRECISION-   1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                              DOMAIN- NAT FOREST
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-      MAP REPOSITORY-  FOC
    MAP NAME- MT VELMA           TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS              MINERAL PROPERTY FILE-
    PRIMARY NAME- ORO FINO
    COMMOD/MOD-  GOLD                                       COPPER
                 SILVER
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FIGURE 3-1

(Explanation Concluded)

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   184
102 NAME- ORO VISTA                                     REFERENCE NUMBER- 0320070701
    STATE- NEVADA                    COUNTY- ELKO                            ELEV:PREC- 2362M:100M
    LATITUDE-    N 41 44 21        PRECISION-    1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                                  DOMAIN- NAT FOREST
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-   FOC
    MAP NAME- MT VELMA             TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE-
    PRIMARY NAME- ORO VISTA
    COMMOD/MOD-  GOLD                                           SILVER
    SMITH. ROSCOE M. MINERAL RESOURCES OF ELKO COUNTY, NEVADA.
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   185
102 NAME- ST ELMO                                       REFERENCE NUMBER- 0320070122
    STATE- NEVADA                    COUNTY- ELKO                            ELEV:PREC- 2362M:500M
    LATITUDE-    N 41 44 46        PRECISION-    1KM
    LONGITUDE- W 115 38 24  REFERENCE POINT- APPROX
    UTM:  ZONE 11N  NORTHING 4622268  EASTING 613082
    PUBLIC LAND SURVEY  TOWNSHIP- 045 N   RANGE- 056 E
        DESCRIPTION     SECTION- 34  SECTION SUBDIVISION-
    RIVER BASIN- 78A   BRUNEAU RIVER                  DOMAIN- UNKNOWN
    STATUS- UNKNOWN          OPERATION TYPE- UNDERGROUND
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-   FOC
    MAP NAME- MT VELMA             TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE- 30.035
    PRIMARY NAME- ST ELMO
    COMMOD/MOD-  GOLD
    NEV BUR MINES BULL 68 PP 6, 18, 19
    ABT 1/2 MI E OF CORNWALL MTN

   186
102 NAME- WHITE GOLD                                    REFERENCE NUMBER- 0320070702
    STATE- NEVADA                    COUNTY- ELKO                            ELEV:PREC- 2362M:100M
    LATITUDE-    N 41 44 21        PRECISION-    1KM
    LONGITUDE- W 115 38 43  REFERENCE POINT- ORE BODY
    UTM:  ZONE 11N  NORTHING 4621490  EASTING 612656
    PUBLIC LAND SURVEY  TOWNSHIP- 044 N   RANGE- 056 E
        DESCRIPTION     SECTION- 03  SECTION SUBDIVISION-
    RIVER BASIN- 78A                                  DOMAIN- NAT FOREST
    STATUS- PAST PRODUCER  OPERATION TYPE- UNKNOWN
    MESA ID NO.           YEAR FIELD CHECKED-       MAP REPOSITORY-   FOC
    MAP NAME- MT VELMA             TYPE- 15 MIN
    1:250.000 MAP NAME- WELLS                  MINERAL PROPERTY FILE-
    PRIMARY NAME- WHITE GOLD
    COMMOD/MOD-  GOLD                                           SILVER
    SMITH. ROSCOE M. MINERAL RESOURCES OF ELKO COUNTY, NEVADA.
      U.S. GEOL. SURVEY. OPEN-FILE REPORT 1976-56. 1976, P. 88.
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